

# RETROSPECTIVE ANALYSIS OF HICCUPS IN PATIENTS AT A COMMUNITY HOSPITAL FROM 1995–2000

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Hiccups are a physiologic phenomenon noted in animals and humans. There is little understanding of what makes hiccups occur and whether or not they have any productive purpose. A retrospective analysis of all patients seen in a community hospital over a 5 year period was conducted to see who is affected by hiccups, evaluate laboratory findings in people with hiccups, and to see what the currently accepted treatment is for hiccups. The vast majority of patients were male, older than 50 years of age, and with co-morbid conditions. Laboratory values appeared to be of little value in determining whether treatment interventions would be effective. Gastroenterology was the service most consulted and EGD the most common procedural intervention conducted, but with little success. No treatments showed a statistically significant effect. (*J Natl Med Assoc.* 2002;94:480–483.)

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Hiccups affect nearly everyone at one time or another. Its physiologic function is still unknown and is often considered a nuisance. They are associated with certain pathological states that stimulate the vagus or phrenic nerves and it is also associated with stimulation of certain areas in the central nervous system (CNS). It is often involuntary but can be self-induced. We all have our own intrinsic rate of hiccupping, which remains fairly constant over the course of any individual hiccup episode, and often occurs with a frequency of 4 to 60 hiccups per minute for any given individual. Individuals also appear to be consistent in the length of time that the hiccups continue.

The medical term for hiccups (or hiccough)

is singultus. It is defined as a diaphragmatic spasm, causing a sudden inhalation that is interrupted or cut short by a spasmodic closure of the glottis, producing a sound.<sup>1</sup>

William H. Dobelle<sup>2</sup> reports that there are approximately 4000 hospital admissions for hiccups each year in the United States alone. Many people are seen as outpatients and an even greater number are never seen. This makes the enrollment of patients with hiccups into a study difficult.

Hiccups are usually spontaneous, uncomplicated and short lived, lasting less than 48 hours. Hiccups are defined as persistent or protracted if they last between 48 hours and 1 month, and intractable when duration is greater than 1 month. The longest duration of record is that of Charles Osborne which lasted 69 years and 9 months.<sup>3</sup>

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This retrospective study reviewed at patients with hiccups seen at Sinai Hospital of Baltimore and describes certain characteristics common to this group. We also examined electrolyte and mineral levels that may stimulate hiccups, the duration of the hiccups and treatment course. Although there is no published theory of electrolyte abnormality inducing hiccups, housestaff lore is that electrolyte abnormalities induce muscle contraction inducing hiccups. Postoperative and pediatric patients were expected to be the largest cohorts in this study.

## METHODS

We reviewed the records of 54 patients with the diagnosis of hiccups. They were admitted or seen in the Emergency Department at Sinai Hospital of Baltimore from 1995 through 2000. Information was reviewed on age, gender, other medical problems, treatment regimen, length of treatment before resolution of hiccups, calcium, albumin, bicarbonate levels as well as type of medical consult obtained to help evaluate the etiology of the hiccups and interventions performed.

## RESULTS

There were 54 charts identified of patients with the diagnosis of hiccups. For a hospital with 22,000 admissions per year that represents 0.00055% of admissions. Out of the 54 patients, 91% were male and 9% were female. Ages ranged from 9 months to 80 years. Two patients were between the ages of 0 and 18 years, 2 patients between 20 and 30 years, 9 patients between 31 and 40 years, 4 patients between 41 and 50 years, and finally 36 patients between the ages of 51 and 80 years. The mean age for patients with hiccups was 59 and the most frequently occurring age was 74 (mode). Hiccups were the primary diagnosis in 22%, with 78% of patients having it as a secondary diagnosis. Duration of hiccups in these patients ranged from 1 day to 30 days. Most patients had the hiccups

for 1 day. Forty eight percent and 52% of patients had hiccups for 48 hours or less and between 48 hours and 30 days, respectively.

We reviewed the total calcium (corrected using the measured albumin and the formula:  $\text{Corrected Calcium} = \text{Measured Calcium} + 0.8 [\text{four-Albumin}]$ ) and bicarbonate levels of these patients. Twenty five and 34 out of the 54 patients had calcium and bicarbonate levels available, respectively. Out of these patients, we found both the calcium and bicarbonate levels to be within the normal range in 96% and 76%, respectively. The normal value ranges from our laboratory for calcium and bicarbonate levels were 8.4 to 10.2 mg/dL and 23 to 29 mg/dL respectively. Four percent of patients were found to have hypocalcaemia and none had. In regards to the bicarbonate level 24% were abnormal, with both 4 out of 8 total above and below the normal range.

Eighty nine percent of patients received some sort of intervention for their hiccups and the rest had their hiccups spontaneously resolve. Patients who had hiccups for greater than 48 hours were more likely to have been treated with thorazine, compazine, baclofen, or rantidine. The intrinsic pattern and length of time for a hiccup attack is not understood. It has been widely observed that a person who has attacks that last for a certain amount of time will continue to have attacks of similar time length and intensity with each attack. The most common medication, thorazine, was used in 54% of patients. Compazine was used in 15% of patients. In 87% of the patients, the hiccups were treated by the primary physicians. Consults were called in 13% (7 patients). While the overall number of consults was low, gastroenterology was the most frequent. They were consulted on 6 out of the 7 patients, 5 of whom had an Esophagogastroduodenoscopy (EGD). All EGD results were normal. The procedure did not appear to speed up recovery or provide additional clues to diagnosis. The remaining consult was conducted by pulmonary medicine. This patient underwent a bronchoscopy.

Table 1. Causes of Hiccups

CNS/PNS	Head and neck	Thorax
Trauma	Foreign body	Trauma
Infection	Goiter	Pneumonia
Vascular	Aneurysm	Pleuritis
Tumors (brain stem)	Pharyngitis/laryngitis	Pericarditis
Multiple sclerosis	Tumor/cysts	Aneurysm
Irritation of phrenic/vagus n. tympanic	Membrane stimulation	Esophagitis
V-P shunts	diaphragmatic eventration	Esophageal stricture/injury
		Esophageal obstruction
		Hiatal hernia
		Diaphragmatic eventration
		Tumor
		Lymphadenopathy
Abdomen	Metabolic/infectious	Drugs
Ulcers	Hypokalemia	IV Methylprednisolone
Abscess	Uremia	Dexamethasone
Gastritis	Hypocalcaemia	Barbiturates
Gastric distention	Influenza	Chlodianazepoxide
Cholecystitis	Herpes zoster	Methyldopa
Pancreatitis	Malaria	
GERD	Tuberculosis	
Neoplasm	ETOH	
Bowel Obstruction	Diabetes Mellitus	
	Hypocarbica (hyperventilation)	
Psychogenic	Surgical	Idiopathic
Stress/excitement	Anesthesia	
Conversion/grief reaction	Post-op	
Anorexia nervosa	Neck extension	
Schizophrenia		
Malingering		

## DISCUSSION

Our data reveal that very few patients are actually seen at or admitted to the hospital for the diagnosis of hiccups. Most of the hiccups are very transient, do not cause much distress and never come to the attention of a medical doctor. The study reveals that most of the patients who presented complaining of hiccups were actually male (91%) and older average for of 59). The reason why this distribution is so skewed towards the male gender is unclear. Hiccups lasting more than 48 hours usually signify an underlying pathologic or disease process and are more likely to be associated with an anatomic or organic cause.<sup>4</sup>

Souadjian and Cain studied 220 patients and found that persistence of hiccups portended an organic cause<sup>5</sup>. This finding was supported by this study. All of the patients who had hiccups for 48 hours or more (52%) had an underlying disease or pathology to which the hiccups were attributed. These are included in the causes of hiccups shown in Table 1. There are numerous potential causes of hiccups, and they may be grouped under the following categories: CNS, head and neck, thorax and abdomen, metabolic, surgical psychogenic, and idiopathic as shown in Table 1.

Hypocalcemia and bicarbonate levels were not associated with hiccups in our study group.

However, it should be noted that not all of our patients had calcium or bicarbonate levels available for review.

Persistent and intractable hiccups have been known to result in malnutrition, weight loss, fatigue and exhaustion, wound dehiscence, and insomnia<sup>6</sup> but we did not find evidence of this during our review of the records.

With only a limited understanding of hiccups progress in treating this problem will be slow. It is unclear if the cause is mechanical, neuronal, centrally mediated, or even if it is a primary respiratory or gastrointestinal occurrence.

The most important part of treatment for hiccups is to look for any underlying causes. Treatment on the patients part starts with physical maneuvers like breathholding, irritation of the nasopharynx, long and slow sips of water, compressing the nose while swallowing, or prolonged pressure on the diaphragm. Manipulation, hypnosis and acupuncture are frequently attempted because

of the relatively benign nature of these forms of intervention.

Medications are frequently used but the data for effectiveness has been scarce. Surgical therapies like phrenic nerve ablation are reserved for the most severe cases, and carry a risk of pulmonary compromise (Lewis JH Hiccups: causes and cures. *J Clin Gastroenterol.* 1985, 7:539–552).

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